

Omayia insertion followed by ventricular peritoneal shunt in case of epidermoid cyst of central nervous system: A case series



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Submission: 19-08-2024

Revision: 27-09-2024

Publication: 01-11-2024

ABSTRACT

Intracranial epidermoid cyst originating from abnormal migration of neuroectodermal cells during embryogenesis. It is a slow-growing tumor commonly found in cerebellopontine angle, fourth ventricle, and sellar/parasellar region. This is a case series of five cases to know the effectiveness of Omayia in pre-operative and early post-operative period followed by ventriculoperitoneal shunt after 2 weeks. This is a prospective observational study done in premier institute of central India from April 2023 to April 2024. A total five cases of different age groups and clinical presentations are included. There is no ventriculoperitoneal shunt blockage when it was followed by early pre- and post-operative period large reservoir Omayia insertion.

Key words: Epidermoid; Omayia; Ventriculoperitoneal shunt; Cerebellopontine cistern; Chemical meningitis; Hydrocephalus

Access this article online

Website:

<http://nepjol.info/index.php/AJMS>

DOI: 10.3126/ajms.v15i11.68896

E-ISSN: 2091-0576

P-ISSN: 2467-9100

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INTRODUCTION

Congenital epidermoid is believed to arise as a result of cellular dysfunction during 3rd–5th week of gestation, which leads to abnormal migration of ectodermal cells. Secondary vesicles such as Otic and optic formed during development may have epithelial misplacement, accounting for laterally placed squamous lined cyst.¹ Intracranially epidermoid have an high affinity for the subarachnoid cisterns at the base of brain. The suprasellar and cerebellopontine (CP) angle cisterns are the most favored sites, whereas the lateral ventricle and optic chiasm, collicular plate, pineal gland and paratrigeminal area,² sphenoid sinus, temporal bone, brainstem, intradiploic, and lateral orbital wall are less favored sites. Epidermoid does not occur in vertebrae an rare in scalp.³ Over three quarters of all intracranial

epidermoid occur in basal cisterns. Epidermoid is well delineated encapsulated lesion that has a characteristic “pearly shine” that permits diagnosis merely on inspection. It may be cystic in suprasellar and intraventricular location, but is usually solid especially in the CP angle, quadrigeminal cistern, and over the corpus callosum.⁴ The solid lesion is characteristically filled with whitish, cheesy material rich in cholesterol crystal, and a debris of desquamated keratinized epidermal cells that accumulated centrally and add to the bulk of the growth.⁵

Epidermoid constitutes of 0.5–1.8% of all intracranial tumors. The incidence is higher in Japan at 2.2%, they usually become symptomatic in third and fourth decade, the average age of incidence is 34 years as reported by Tan; in India, it is a decade earlier.⁶

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Clinical, Surgical, Pathological and Radiological history of 5 cases of intracranial epidermoid										
Case	Age/sex	Clinical presentation	Location	Duration	Radiology findings	CSF (R/M)	Omayya	V-P shunt	Ch15emical meningitis	Follow-up
1	34/f	Headache, difficulty in walking, right ear decreased hearing	Right CP angle cistern	6 month	MRI brain T1 hyperintense T2 diffusion restriction with no contrast enhancement	Pre-operative- cell-40/mm ³ protein-20 mg/dL post-operative- cell-380/mm ³ protein-100 mg/dL	Pre-operative placement	Post-operative day 10	+	15 day, 3 month
2	50/f	Headache, vomiting, right hemiparesis, 7 th nerve palsy	Left CP angle cistern with extension to posterior third ventricle	2 year	MRI brain T1 hyperintense T2 diffusion restriction with no contrast enhancement	Pre-operative- cell-10/mm ³ protein-5 mg/dL post-operative- cell-100/mm ³ protein-20 mg/dL	Pre-operative placement	Post-operative day 7	+	15 day, 3 month
3	42/m	Headache, bilateral visual impairment, dizziness	Optic chiasm cistern extended to left subtemporal region	3 year 6 month	MRI brain T1 hyperintense T2 diffusion restriction with no contrast enhancement	Pre-operative- cell-05/mm ³ protein-05 mg/dL post-operative- cell-140/mm ³ protein-40 mg/dL	Pre-operative placement	Post-operative day 05	+	15 day, 3 month
4	48/f	Headache, fever, neck stiffness, diplopia	Right cerebellar with extension to 4th ventricle	1 year	MRI brain T1 hyperintense T2 diffusion restriction with no contrast enhancement	Pre-operative- cell-20/mm ³ protein-10 mg/dL post-operative- cell-400/mm ³ protein-100 mg/dL	Pre-operative placement	Post-operative day 14	+	15 day, 3 month
5	52/M	Headache, tinnitus, dizziness, rt facial pain	Right CP angle cistern	1 year 6 month	MRI brain T1 hyperintense T2 diffusion restriction with no contrast enhancement	Pre-operative- cell-10/mm ³ protein-05 mg/dL post-operative- cell-140/mm ³ protein-80 mg/dL	Pre-operative placement	Post-operative day 7	+	15 day, 3 month

CP: Cerebellopontine, CSF: Cerebrospinal fluid

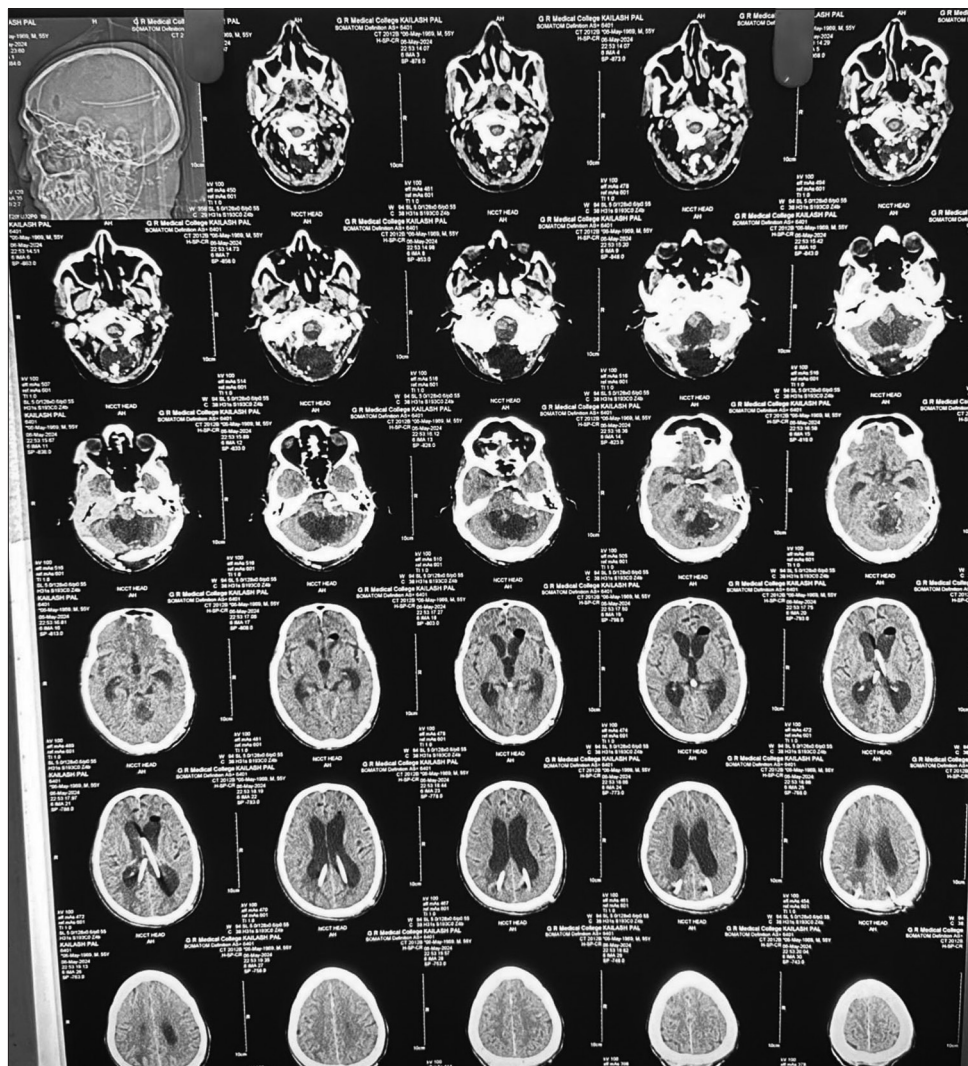


Figure 1: Omya reservoir on the right and ventriculoperitoneal shunt on the left Frazier point

CASE PRESENTATION

Study design

This is a case series of five cases, was performed in the Department of Neurosurgery of the premier institute of central India from January 2024 to July 2024. All histologically confirmed cases of epidermoid of central nervous system who gave written informed consent to participate in study were included, study performed in neurosurgery department of our institute for 7 months (January 2024–July 2024).

Ethical approval

The approval of the institutional Ethical board was obtained from Gajra Raja Medical College Institutional Ethical Committee under the letter number (13427-62 dated April 18, 2023).

A total five cases of different age groups and clinical presentations are included. There are two cases of CP and

posterior fossa epidermoid. one case of cp angle cistern with posterior third ventricular epidermoid, another single case of cp angle cistern with fourth ventricular extension epidermoid, with one case of optic chiasm cistern with extension to the left sub temporal space were included in the study. There is significant improvement in pre-operative and early post-operative period with decompression of ventricle by removing cerebrospinal fluid (CSF) through Omya even in presence of chemical meningitis and CSF with high protein that there was no blockage of Omya in all five cases. After 1–2 weeks as the meningitis improved and CSF report comes normal patient underwent ventricular peritoneal shunt and all 05 shunt function properly in post-operative period till 3 months follow-up (Figure 1).

DISCUSSION

Since these tumors may intimately involve neural and vascular structures and be densely adherent to them, such

structure is at high risk for both direct and stretch injuries during the course of surgery.

An operative complication that is unique to this type of tumor and that occur in approximately 40% of cases is post-operative aseptic meningitis, which can last for number of weeks. Case reports from the available literature suggest that this complication occurs far more frequently when removal of cyst has been incomplete. Even when only a few remnants of the capsule are known to have been left behind, there is a higher incidence of aseptic meningitis, then when removal has been complete. If the chemical meningitis is severe and long standing, it can lead to a granulomatous type of arachnoiditis in which nearby nerve roots become encased in a thick layer of reactive arachnoidal tissue.⁷

Post-operative hydrocephalous is another not uncommon complication following removal of these tumors. It occur more frequently in those patient who develop post-operative aseptic meningitis, and it may be concurrent with this inflammatory condition in the post-operative period.⁸ Shunting is usually required but there is high chance of shunt blockage with patient with aseptic meningitis, so pre-operative period an Omayra reservoir is placed and after 1–2 week depending on CSF report. Ventriculoperitoneal shunt was placed.

CONCLUSION

Our prospective study aimed to highlight the effectiveness of Omayra insertion in pre-operative and early post-operative period, where if initially ventriculoperitoneal shunt was done chances of blockage and failure is high due to chemical meningitis; in our study, we convert Omayra

to ventriculoperitoneal shunt after 1–2 week depending on CSF report and there is no evidence of chemical meningitis.

ACKNOWLEDGMENT

We sincerely acknowledge all our patient and staff of neurosurgery department.

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Authors Contribution:

HDP- Definition of intellectual content, literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation and submission of article; **AS**- Concept, design, clinical protocol, manuscript preparation, editing, and manuscript revision, design of study, statistical analysis and interpretation, review manuscript; **VK**- Review manuscript; **SS**- Literature survey and preparation of figures; **ASha**- Coordination and manuscript revision.

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Source of Support: Nil, **Conflicts of Interest:** None declared.